

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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*Ex parte* TETSUHIKO MIZOGUCHI, TOSHIRO SATO, MASASHI SAHASHI,  
MICHIO HASEGAWA, HIROSHI TOMITA, and ATSUHITO SAWABE

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Appeal No. 2000-1990  
Application No. 08/701,918

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HEARD: Dec. 12, 2002

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Before RUGGIERO, BARRY, and SAADAT, *Administrative Patent Judges*.  
BARRY, *Administrative Patent Judge*.

**DECISION ON APPEAL**

A patent examiner rejected claims 53, 55, 58, 59, and 61-68. The appellants appeal therefrom under 35 U.S.C. § 134(a). We reverse.

**BACKGROUND**

The invention at issue on appeal is a planar magnetic element such as a planar

Planar inductors need to have a sufficient quality coefficient ("Q") in the frequency band for which they are used. (*Id.*) The value of the quality coefficient is expressed as  $Q = 2\pi f L/R$ , where  $f$  is the operating frequency,  $L$  is the inductance of the coil, and  $R$  is its resistance. (Appeal Br. at 3.) According to the appellants, however, coil conductors in conventional planar inductors made by means of a thin-film process cannot have a large cross-sectional area. (Spec. at 3.) Therefore, they explain, these elements cannot help but have a very high resistance and an extremely small inductance, which result in "an insufficient quality coefficient Q." (*Id.*)

In contrast, the inventive planar magnetic element comprises a substrate, a first magnetic layer arranged over the substrate, a first insulation layer over the first magnetic layer, a spiral planar coil formed of a conductor over the first insulation layer, a second insulation layer over the spiral coil, and a second magnetic layer over the second insulation layer. Importantly, the spiral coil features a "gap aspect ratio" of at least 1; the gap aspect ratio is the ratio of the coil's thickness to the gap between any adjacent two of the coil's turns. The appellants assert that, when used as an inductor, the inventive element "has a great quality coefficient Q." (*Id.* at 145.) Because the

A further understanding of the invention can be achieved by reading the following claim.

61. A planar magnetic element, comprising:

a semiconductor substrate;

at least one patterned conductive layer formed on said semiconductor substrate; and

a [sic] insulation layer formed on said at least one patterned conductive layer,

wherein said at least one patterned layer is patterned in the shape of a planar coil having a plurality of turns and having a gap aspect ratio greater than one, said gap aspect ratio being the ratio of the thickness of said at least one patterned conductive layer to a width of a gap between any adjacent two of said plurality of turns.

Claims 61 and 58 stand rejected under 35 U.S.C. § 102(b) as anticipated by either Goldberg et al. ("Goldberg"), *Issues Related to 1-10-MHZ Transformer Design*, IEEE Trans. on Power Elecs., Jan. 1989, pp. 113-23; U.S. Patent No. 2,980,874 ("Tarbox"); or U.S. Patent No. 2,998,583 ("Worcester"). Claims 61, 53, 58, 63, 65, and 66 stand rejected under § 102(b) as anticipated by U.S. Patent No. 4,029, 926 ("Austin"). Claims 62, 55, 59, 64, 67, and 68 stand rejected under 35 U.S.C. § 103(a)

## OPINION

Rather than reiterate the positions of the examiner or the appellants *in toto*, we address the main point of contention therebetween. Admitting that "Goldberg has polyimide substrates," (Examiner's Answer at 6), and alleging that "a glass substrate is insulating and so are polyimide substrates," (*id.*), the examiner opines, "it is believed that the polyimide substrates meet the language of the claims. . . ." (*id.* at 7.) He adds, "[t]he above arguments apply to the insulating substrates of Worcester, Austin and Tarbox." (*id.*) The appellants argue, "*Goldberg et al*, *Tarbox* and *Worcester* fail to teach or suggest a semiconductor substrate, as recited," (Appeal Br. at 16), and "*Austin* fails to disclose a semiconductor substrate as claimed. . . ." (*id.* at 14.)

"Analysis begins with a key legal question -- *what* is the invention *claimed*? Claim interpretation . . . will normally control the remainder of the decisional process." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). "The general rule is, of course, that terms in the claim are to be given their ordinary and accustomed meaning." *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999) (citing *Renishaw PLC v.*

Here, independent claims 61-64 specify in pertinent part the following limitation:  
"a semiconductor substrate. . . ." The ordinary and accustomed definition of a  
"semiconductor" is "[a]n electronic conductor, with resistivity in the range between  
metals and insulators, in which the electric-charge-carrier concentration increases with  
increasing temperature over some temperature ranges." *The IEEE Standard Dictionary  
of Electrical and Electronics Terms* 963 (6th ed. 1997)(copy attached).<sup>1</sup>

"Although an applicant may be his own lexicographer," *In re Thrift*, 63 USPQ2d  
2002, 2006 (CA FC 2002)(citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967,  
980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370, 38  
USPQ2d 1461 (1996)), we are unpersuaded that the appellants' specification supports  
the examiner's position that the appellants have "use[d] the word semiconductor to  
both the planar inductor of Figs. 5 and 6 and the planar transformer of Figs. 7 and 8,  
the substrate 10 is made of silicon," (Spec. at 26), it adds that this semiconducting  
"substrate 10 can be replaced by a glass substrate." (*Id.*) "When a glass substrate is  
used in place [of] the silicon substrate 10," (*id.*), it explains, "the insulation layer 20A,

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which is beneath the magnetic layer 30A, can be dispensed with." (*Id.*) Giving the terms in the independent claims their ordinary and accustomed meaning, therefore, the limitation requires a substrate composed of an electronic conductor, with resistivity in the range between metals and insulators, in which the electric-charge-carrier concentration increases with increasing temperature over some temperature ranges.

"Having construed the claim limitations at issue, we now compare the claims to the prior art to determine if the prior art anticipates those claims." *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349, 64 USPQ2d 1202, 1206 (Fed. Cir. 2002). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (citing *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 715, 223 USPQ 1264, 1270 (Fed. Cir. 1984); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 USPQ 781, 789 (Fed. Cir. 1983)). "[A]bsence from the reference of any claimed element negates anticipation." *Kloster Speedsteel AB v. Crucible, Inc.*, 793 F.2d 1565,

and that the substrates of Tarbox, Worcester, and Austin are also "insulating substrates. . . ." (*Id.* at 7.) As evident from the aforementioned definition, moreover, the ordinary and accustomed meaning of a "semiconductor" differentiates it from an insulator by stating that a semiconductor features "a resistivity in the range between metals and **insulators**. . . ." *IEEE Standard Dictionary* at 963 (emphasis added).

We are unpersuaded that the claimed "semiconductor substrate" reads on the references' insulating substrates.<sup>2</sup> Absence from the references of the claimed semiconductor substrate negates anticipation. Therefore, we reverse the anticipation rejections of claims 61, 53, 58, 63, 65, and 66.

"In rejecting claims under 35 U.S.C. Section 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness." *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) (citing *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992)). "A *prima facie* case of obviousness is

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<sup>2</sup>In the "Response to Argument" section of his answer, the examiner also makes the following assertion. "Goldberg et al in addition to the polyimide substrates, have

established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." *In re Bell*, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) (quoting *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976)).

Here, the examiner fails to allege, let alone show, that teachings from the prior art itself would appear to have suggested replacing the insulating substrate of either Goldberg, Tarbox, Worcester, or Austin with a semiconductor substrate. Therefore, we reverse the obviousness rejections of claims 62, 55, 59, 64, 67, and 68.

#### CONCLUSION

In summary, the rejections of claims 61, 53, 58, 63, 65, and 66 under § 102(b) and the rejections of claims 62, 55, 59, 64, 67, and 68 under § 103(a) are reversed.

REVERSED





LANCE LEONARD BARRY  
Administrative Patent Judge

MAHSHID D. SAADAT  
Administrative Patent Judge

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Application No. 08/701,918

Page 10

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After signing, please return to Barry for disk.

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Prepared By: APJ BARRY

**DRAFT SUBMITTED:** 28 Jan 04

**FINAL TYPED:**

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